

## Claims

1. A method for an improved inter-PDSN (Packet Data Serving Node) dormant mode handoff comprising:

5 exchanging, by an Access Network (AN) with a target PDSN, signaling to support an inter-PDSN handoff of a packet data session of a mobile station (MS);

establishing, by the AN with the MS, a traffic channel (TCH) to support the inter-PDSN handoff;

10 determining, by the AN, that signaling between the MS and the target PDSN related to the inter-PDSN handoff has been completed;

in response to the determination that signaling has been completed, releasing, by the AN, the TCH.

15 2. The method of claim 1, wherein signaling to support an inter-PDSN handoff comprises signaling from the group consisting of an A11-Registration Request and an A11-Registration Reply.

20 3. The method of claim 1, wherein signaling related to the inter-PDSN handoff comprises signaling from one or more of the group of signaling types consisting of point-to-point (PPP) connection establishment signaling and mobile internet protocol (MIP) signaling.

25 4. The method of claim 1, wherein releasing the TCH is performed in response to determining, by the AN, that signaling between the MS and the target PDSN related to the inter-PDSN handoff has been completed, that the MS has indicated that it does not have data to send after the dormant mode handoff, and that the AN has not received packet data from the MS after completing the signaling related to the inter-PDSN handoff.

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5. The method of claim 1, further comprising:

receiving, by the AN from the MS, an origination message indicating that the MS is requesting a dormant mode handoff and does not have data send;

5 sending, by the AN to the target PDSN, an indication that a handoff is being performed and the MS does not have data ready to send.

6. The method of claim 1, further comprising:

10 in response to the determination that signaling has been completed, releasing, by the AN, the Signaling Connection Control Part (SCCP) connection between the AN and a mobile switching center (MSC).

7. The method of claim 1, wherein determining that signaling has been completed comprises

15 receiving, by the AN from the target PDSN, an indication that signaling between the MS and the target PDSN related to the inter-PDSN handoff has been completed.

20 8. The method of claim 7, wherein determining that signaling has been completed comprises

receiving, by the AN from the target PDSN, a request to transition the packet data session from an active state to a dormant state.

25 9. The method of claim 7, wherein the indication that signaling related to the inter-PDSN handoff has been completed is included within an A11-Session Update message.

30 10. The method of claim 9, wherein the indication that signaling related to the inter-PDSN handoff has been completed is conveyed via a Normal Vendor/Organization Specific Extension (NVSE) of the A11-Session Update message.

11. The method of claim 7, further comprising sending, by the target PDSN to the AN, the indication that signaling related to the inter-PDSN handoff has been completed, in response to determining, by the target PDSN, that signaling between the MS and the target PDSN related to the inter-PDSN handoff has been completed and that the target PDSN has not received packet data from the MS or for the MS in addition to the signaling related to the inter-PDSN handoff.

12. The method of claim 11, wherein sending the indication that signaling related to the inter-PDSN handoff has been completed is performed in response to determining additionally, by the target PDSN, that the AN has indicated that the MS does not have data ready to send.

13. The method of claim 1, further comprising receiving, by the AN from the target PDSN, a timer value for a packet data inactivity timer.

14. The method of claim 13, wherein the timer value is received via a message from the group consisting of an A11-Session Update message and an A11-Registration Reply message.

15. The method of claim 13, wherein determining that signaling has been completed comprises

determining, by the AN, that the packet data inactivity timer has expired and that the MS and the target PDSN are no longer exchanging packet data.

16. The method of claim 13, further comprising sending, by the target PDSN to the AN, the timer value for a packet data inactivity timer, in response to determining, by the target PDSN, that signaling between the MS and the target PDSN related to the inter-PDSN handoff has been completed and that the target PDSN has not received packet data from the MS or for the MS in addition to the signaling related to the inter-PDSN handoff.

17. The method of claim 13, wherein sending the timer value is performed in response to determining additionally, by the target PDSN, that the AN has indicated that the MS does not have data ready to send.

5 18. The method of claim 1, further comprising starting, by the AN, an MS-PDSN handoff signaling timer, in response to detecting an inter-PDSN handoff for the MS.

10 19. The method of claim 18, wherein determining that signaling has been completed comprises  
determining, by the AN, that the MS-PDSN handoff signaling timer has expired and that the MS and the target PDSN are no longer exchanging packet data.

20. An Access Network (AN) for facilitating an improved inter-PDSN (Packet Data Serving Node) dormant mode handoff, the AN comprising:

a packet control function (PCF)

adapted to exchange, with a target PDSN, signaling to support  
an inter-PDSN handoff of a packet data session of a  
mobile station (MS);

a base station (BS), communicatively coupled to the PCF,

adapted to establish, with the MS, a traffic channel (TCH) to  
support the inter-PDSN handoff,

adapted to determine that signaling between the MS and the  
target PDSN related to the inter-PDSN handoff has been  
completed, and

adapted to release the TCH, in response to the determination  
that signaling has been completed.

21. The AN of claim 20, wherein the BS, as adapted to determine that signaling has been completed, is adapted to

receive, from the target PDSN via the PCF, an indication that signaling  
between the MS and the target PDSN related to the inter-PDSN handoff has  
been completed.

22. The AN of claim 20, wherein the BS is further adapted to receive, from the target PDSN via the PCF, a timer value for a packet data inactivity timer in response to signaling to support the inter-PDSN handoff exchanged by the PCF with the target PDSN.

23. The AN of claim 22, wherein the BS, as adapted to determine that signaling has been completed, is adapted to

determine that the packet data inactivity timer has expired.

24. The AN of claim 20, wherein the BS is further adapted to start an MS-PDSN handoff signaling timer, in response to detecting an inter-PDSN handoff for the MS.
- 5 25. The AN of claim 24, wherein the BS, as adapted to determine that signaling has been completed, is adapted to  
determine that the MS-PDSN handoff signaling timer has expired and that the MS and the target PDSN are no longer exchanging packet data.